magnet **50**. More specifically, the magnet **25** is completely surrounded with an encapsulation **51**. The thickness of the encapsulation **51** along the side of the magnet **25** is such as to provide an interference fit in the bore **23**, so that the magnet may be retained in place without the use of the retainers **26** or **35**. The thickness of the encapsulation **51** along the outer surface of the magnet **25** is such as to provide the necessary protection of the magnet **25** from shock as a result of contact with the bit **30**. Also, it will be appreciated that, in the event that the magnet **25** is fractured, the encapsulation **51** will prevent the escape of any pieces of the magnet **25**.

In the embodiment illustrated in FIG. **7**, the encapsulation of the magnet is in the nature of a settable adhesive which may be deposited in liquid form around the magnet **25** in the bore. Thus, a thin layer of adhesive could first be deposited in the bore and the magnet set thereon and then the remainder of the adhesive flowed around the sides and outer surface of the magnet. Alternatively, the magnet could be set on the end surface of the bore and then adhesive flowed around the magnet in the manner described above. After the adhesive has set, it serves not only to retain the magnet in the bore **23** of the bit holder **20** or the bore **43** of the bit holder **40**, but would also provide a buffering protective layer between the magnet and the associated bit **30**.

While, in the embodiment of FIG. **7**, the encapsulation of the magnet is provided in situ in the bore, it will be appreciated that the encapsulation could be provided before the magnet is inserted in the bore of the bit holder. Referring to FIG. **8**, there is illustrated another embodiment of an encapsulated magnet **55**, wherein the magnet **25** is completely surrounded with an encapsulation **56**, which may be formed of any suitable material, including plastic, rubber, brass or the like, but for purposes of illustration is shown as having a metal encapsulation. The dimensions of the encapsulation **56** may be similar to that of the encapsulation **51** of FIG. **7** and for the same reasons. In this case, the prefabricated encapsulated magnet **55** is press-fitted into the bore **23**, the encapsulation **56** protecting the magnet **25** from fracture during the press-fitted insertion.

Referring to FIG. **9**, there is an alternative embodiment of the encapsulated magnet, generally designated by the numeral **60**, which utilizes encapsulation **61** covering only the outer and side surfaces of the magnet **25**. If desired, any of the magnets **50**, **55** or **60** could be used together with the cushion **27** between the magnet and the end surface of the bore. Also, while the encapsulated magnet has been illustrated as mounted in the bore **23** of the bit holder **20**, it will be appreciated that it could also be disposed in the bore **43** of the bit holder **40**.

From the foregoing, it can be seen that there has been provided an improved bit holder and a hand tool incorporating same, which afford the improved magnetic holding ability of a neodymium magnet, while at the same time minimizing risk of fracture of the magnet, and assuring retention of the magnet in place, even in the event of fracture.

We claim:

1. A bit holder comprising: a cylindrical body having a distal end surface and an axis, said body having formed in said end surface an axial bore terminating at an inner end surface, a permanent magnet received in said bore and having an outer surface, and retaining structure in contact with the outer surface of said magnet and interference fitted in said bore to retain said magnet in said bore, said bore having a portion of non-circular transverse cross section outboard of said retaining structure defining a bit-receiving

socket, said retaining structure including a discrete, flat, imperforate retaining member friction fitted in said bore outboard of said magnet, said retaining member and said inner end surface cooperating to retain said magnet therebetween.

2. The bit holder of claim **1**, wherein said magnet is formed of neodymium.

3. The bit holder of claim **1**, wherein said magnet has a transverse cross-sectional size smaller than the cross-sectional size of said bore so as to be freely receivable in said bore.

4. The bit holder of claim **1**, wherein said retaining structure is formed of metal.

5. The bit holder of claim **1**, wherein said retaining structure is formed of plastic.

6. The bit holder of claim **1**, and further comprising a cushioning member disposed between said magnet and said inner end surface.

7. The bit holder of claim **1**, wherein said portion of said bore defining said socket comprises a counterbore having a cross-sectional size larger than that of the remainder of said bore.

8. The bit holder of claim **7**, wherein said retaining structure is disposed in said counterbore.

9. The bit holder of claim **1**, wherein said bore has the same cross section along its entire length.

10. In combination with the bit holder of claim **1**, a bit having a transverse cross section such as to be mateably receivable in said socket in driven engagement with said body.

11. The bit holder of claim 1, wherein said retaining member is a substantially circular disk.

12. A hand tool comprising: an elongated shank having a handle end and a working end and a longitudinal axis, a cylindrical body at said working end having a distal end surface, said body having formed in said end surface an axial bore terminating at an inner end surface, a permanent magnet received in said bore and having an outer surface, and retaining structure in contact with the outer surface of said magnet and interference fitted in said bore to retain said magnet in said bore, said bore having a portion outboard of said retaining structure of non-circular transverse cross section defining a bit-receiving socket, said retaining structure including a discrete, flat, imperforate retaining member friction fitted in said bore outboard of said magnet, said retaining member and said inner end surface cooperating to retain said magnet therebetween.

13. The hand tool of claim 12, wherein said magnet is formed of neodymium.

14. The hand tool of claim 12, wherein said portion of said bore defining said socket comprises a counterbore having a cross-sectional size larger than that of the remainder of said bore.

15. The hand tool of claim 12, wherein said bore has the same cross section along its entire length.

16. The hand tool of claim 12, wherein said retaining member is a substantially circular disk.

17. A bit holder comprising:

a body having a distal end surface,

said body having a bore formed in said end surface,

a magnet received in said bore and having an outer surface,

and a discrete flat retaining member friction fitted in said bore outboard of said magnet and substantially covering said outer surface of said magnet to retain said magnet in said bore,

said bore having a portion outboard of said retaining member defining a bit-receiving socket.

18. The bit holder of claim 17, wherein said magnet is a permanent magnet.

19. The bit holder of claim 17, wherein the portion of said bore outboard of said retaining member is non-circular in transverse cross section.

20. The bit holder of claim 17, wherein said retaining member is imperforate.

21. The bit holder of claim 17, wherein said body has an axis of rotation extending through said end surface, said bore being formed axially in said end surface.

22. The bit holder of claim 17, wherein said bore terminates at an inner end surface, said retaining member cooperating with said inner end surface to retain said magnet therebetween.

23. The bit holder of claim 17, wherein said retaining member is a substantially circular disk.

24. A bit holder comprising:

a body having a distal end surface,

said body having a bore formed in said end surface,

a magnet received in said bore and having an outer surface,

and a discrete flat retaining member friction fitted in said bore outboard of said magnet and having a continuous, closed, non-reentrant outer periphery to retain said magnet in said bore,

said bore having a portion outboard of said retaining member defining a bit-receiving socket.